

G.703/64K-over-IP Gateway

TC3846-1

- Extends G.703/64k Co-directional Interface over Ethernet
- Less Than 5 msec. Latency, One Way
- Point-to-Point & Point-to-MultiPoint Applications
- VLAN and QoS Support
- Manage Via Web, SNMP, Serial Console, Telnet
- Temperature & Power Consumption Monitoring
- Extreme Temp (-40°C to +80°C) Optional
- Meets or Exceeds IEC 61850-3, IEEE1613 & NEMA TS-2 Standards
- Member of the JumboSwitch® Product Family



TC3846-1 G.703/64k-over-IP Gateway

Featuring extremely low latency of less than 5 msec., one way, the TC3846-1 G.703/64k-over-IP Gateway extends 64kbps G.703 co-directional circuits over Ethernet/IP networks. It is simple to configure and supports both point-to-point and point-to-multi point topologies.

Extremely low latency (minimal end-to-end processing delay) is achieved by using high-performance adaptive clock recovery, buffering and forwarding technology. To insure reliable communications, the TC3846-1 supports VLAN and QoS for packet prioritization.

Key features include Traffic Monitoring and Statistics, Network Time Server (NTS), Remote Firmware Upgrade and Temperature and Power Consumption Monitoring.

Setup, diagnostics, and management are accessed via Web, SNMP, Serial Console, and Telnet. Diagnostics include LED indicators and local and remote loopback to assist with troubleshooting and maintenance.

Each G.703/64k channel is independent and transparent to protocols and signaling used. Clear channel and octet aligned modes are supported.

The TC3846-1 interface card can fit into any available JumboSwitch housing option including 1S/2S Standalone chassis and 2U/4U card cages. Power supply options are 12VDC, 24VDC, -48VDC or 115/230VAC. Standard operating temperature is -20°C to +70°C and the extreme temperature version is -40°C to +80°C.

Applications

Typical applications include extending G.703 circuits across IP networks.

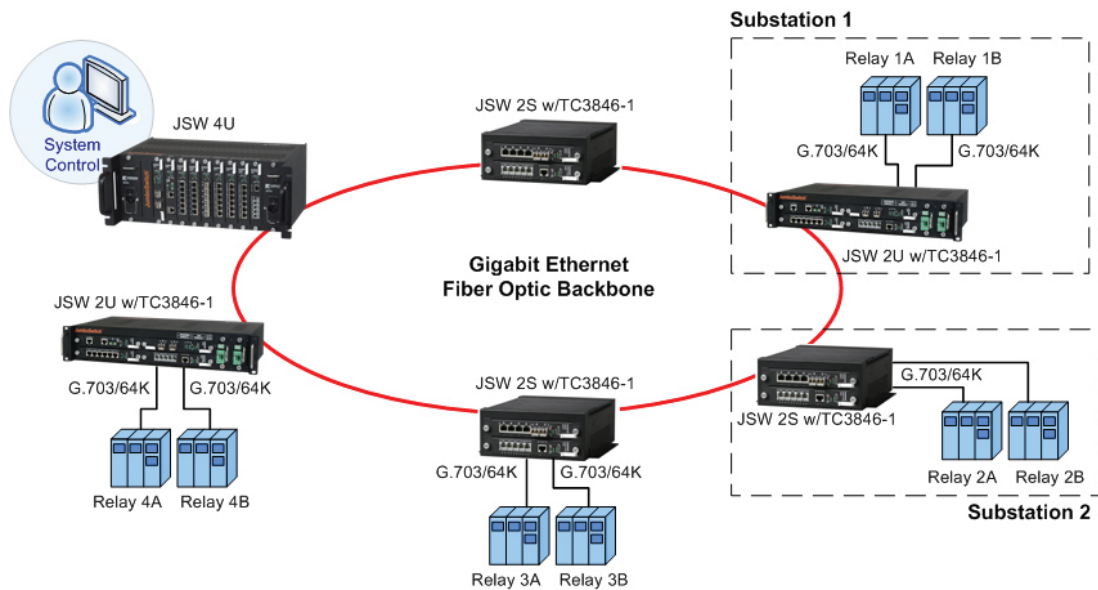
For example, the TC3846-1 is used to extend Teleprotection relays with a G.703/64K interface over existing Layer 2 / Layer 3 Networks.

Environmental & EMI Compliance

The JumboSwitch and its product family interface cards meet or exceed all pertinent industrial environmental and EMI industry standards including IEC 61850-3 and IEEE 1613 for networking devices installed in electric power substations and NEMA TS-2 for traffic control environments. The chart below details information related to specific JumboSwitch environmental and EMI compliance testing.

TC Communications Industrial grade products are manufactured with special components, connectors and circuitry. This ensures reliable operation in the event of wide temperature swings, electromagnetic interference (EMI), radio interference, vibrations, or moisture and humidity fluctuations. Conformal coating is optional

	Tests	Industrial Standards	TC Communications - JumboSwitch Type Test and Levels	
			Power Supply Unit (PSU)	RJ-45 &
Temperature/Humidity	Low Temperature Use	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-1; Ae; -40°C; 16 hour	
	Low Temperature Storage	IEC 61850-3, IEEE 1613, NEMA TS-2		
	High Temperature Use	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-2; Be; +80°C; 16 hour	
	High Temperature Storage	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-2; Bd; +85°C; 16 hour	
	Damp Heat	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-30; Db; +55°C; 95%; 96 hours	
Mechanical	Vibration	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-6; Fc; 3 - 150 Hz; 7.5 mm; 2 g; 10 sweeps per axis	
	Shock	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-27; Ea; 30g; 11ms	
ElectroMagnetic Compatibility	Electrostatic Discharge Immunity	IEEE 1613	IEC 61000-4-2; 8kV contact; 15 kV air	
	Radiated RF Immunity	IEC 61850-3, IEEE 1613	IEC 61000-4-3; 80 MHz - 1000 MHz; 20 V/m; AM 80% 1 kHz	
	EFT/Burst Immunity	IEC 61850-3, IEEE 1613	IEC 61000-4-4; 4 kV CM	IEC 61000-4-4; 4 kV CM
	Surge Immunity	IEC 61850-3	IEC 61000-4-5; 4 kV LG; 2 kV LL	IEC 61000-4-5; 4 kV LG; 2 kV LL
	Conducted RF immunity	IEC 61850-3	IEC 61000-4-6; 150 kHz - 80 MHz; 10 V; AM 80% 1 kHz	IEC 61000-4-6; 150 kHz - 80 MHz; 10 V; AM 80% 1 kHz
	Magnetic Field Immunity	IEC 61850-3	IEC 61000-4-8; 50 Hz; 100 A/m cont.; 1000 A/m 1 s	
	Damped Oscillatory Magnetic Field Immunity	IEC 61850-3	IEC 61000-4-10; 100 kHz; 30 A/m	
Power Supply Unit (PSU) Variations	AC Voltage Dips	IEC 61850-3	IEC 61000-4-11; 30% & 100%, 0.5s	NA
	DC Voltage Dips	IEC 61850-3	IEC 61000-4-29; 40% & 70%, 0.1s	NA
	Damped Oscillatory Wave	IEC 61850-3	IEC 61000-4-12; 2.5 kV CM, 1.0 kV DM @1MHz	IEC 61000-4-12; 2.5 kV CM, 1.0 kV DM @ 1MHz
	Conducted PF CM Voltage	IEC 61850-3	IEC 61000-4-16; 50 Hz; 30 V cont.; 300 V 1s	IEC 61000-4-16; 50 Hz; 30 V cont.; 300 V 1s
	Conducted Emission	IEC 61850-3	CE/FCC/CISPR22 class A	CE/FCC/CISPR22 class A
	Conducted emission	IEC 61850-3	CE/FCC/CISPR22 class A	CE/FCC/CISPR22 class A
	Radiated emission	IEC 61850-3	CE/FCC/CISPR22 class A	
Dielectric	Dielectric 50 Hz Test	IEEE 1613	IEC 60255-5; 2 kV	IEC 60255-5; 0.5 kV
	Impulse Voltage Test	IEEE 1613	IEC60255-5; 5 kV	IEC 60255-5; 5 kV



Typical Teleprotection Application Using TC3846-1 to Extend G.703/64K (Co-Directional) over Ethernet Network

Data Rates

G.703	.....64kbps
Ethernet	.....10/100 Mbps Full Duplex
Console	.....9.6K

Connection Capacity

G.703/64K	.....2 Channels
Ethernet	.....1 Port

Electrical

G.703/64k Interface

LineCode	.....AMI
Standards	.....G.703, G.823
Connector	.....RJ45F
Impedance	.....120 Ohm

Ethernet Interface

Standards	.....IEEE 802.3, .....802.3u, 802.1p&Q
Connector	.....RJ45F
Console Port	.....RJ45F

System

Bit Error Rate1 in 10 ¹⁰ or Better
----------------	--------------------------------------

Diagnostic Functions

Local and Remote Loopback for G.703/64K and Ethernet

LEDs

Unit Status.....PWR (A, B), Alarm
.....Vcc, CS, MS
G.703/64K.....Status
Ethernet.....Link/Act

Power

Standard.....12VDC
Optional.....24, -48 VDC
.....90-260 VAC, 50/60Hz
Power Consumption.....<10W

Operating Temperature

High Temp-20°C to 70°C
Extreme Temp-40°C to 80°C

Storage

Temperature.....-40°C to 90°C
Humidity.....95% non-condensing

Physical (In JumboSwitch 1S Chassis)

Height.....(3.89 cm) 1.53"
Width.....(18.54 cm) 7.3"
Depth.....(24.87 cm) 9.79"
Weight.....(0.4 kg) 1.0 lbs



#1045959

TC Communications, Inc.
17881 Cartwright Road
Irvine, CA 92614 U.S.A.
Factory Tel: (949) 852-1972
Fax: (949) 852-1948

Sales Office
U.S.A. Domestic International:
(800) 569-4736 (949) 852-1973

Web Site: www.tccomm.com
E-mail: sales@tccomm.com

4/09

Note - Information contained in this data sheet is subject to change without prior notice. 010A



www.JumboSwitch.com

